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Attorney Docket No.: 520219-273
Amendment After Final Office Action

Remarks

Claims 38-41 and 58-64 have been canceled. Claim 1 has been amended to include the limitations of claim 58, and claim 58 has been canceled. Finally, claims 1, 2, 17, 20, 23, 24, 42 and 43 have been amended to correct a typographical error (changing “course” to “coarse”). Review and reconsideration are respectfully requested.

At paragraph 4 of the Office action, claims 1, 8, 11, 17, 42, 49, 52 and 56-57 are rejected as allegedly defining obvious subject matter over U.S. Pat. No. 4,656,674 to Medwell in view of the Japanese '106 patent and further in view of U.S. Pat. No. 5,630,230 to Fujino et al. In particular, the Office action takes the position that the Medwell reference discloses the basic claimed process of the invention, but does not teach a thermosetting resin-impregnated fabric having ceramic particles mixed therein. The Office action then takes the position that it would have been obvious to one of ordinary skill in the art to provide the thermosetting resin-impregnated fabric having ceramic particles mixed therein of the Japanese '106 reference, and to use such a ceramic fabric in the process of the Medwell reference. The Office action takes the position that the Fujino patent teaches that one of ordinary skill in the art would use the fabric of the Japanese '106 reference in the helmet of the Medwell reference.

At page 4 of the final Office action, it is indicated that it would have been obvious to provide the *fabric* of the Japanese reference in the process of the Medwell reference. Similarly, at page 18 of the final Office action, it is indicated:

...it would have been obvious for one of ordinary skill in the art to have provided a thermosetting resin impregnated *fabric* having ceramic particles mixed therein as taught by JP 1-145106 in the process of Medwell...

(emphasis added)

The previous Office actions include similar language (see, for example, pages 3 and 7 of the Office action mailed February 28, 2003). However, at page 19 the final Office action indicates that the teachings of the Japanese '106 reference are provided merely to show that

mixing ceramic particles with a thermosetting resin is a known process to a person ordinarily skilled.

Because these two statements in the final Office action are somewhat contradictory, the undersigned requested a telephone interview with the Examiner, which took place on October 2, 2003, and the undersigned would like to thank the Examiner for taking the time to discuss this case. During the telephone interview the Examiner explained that the rejection contemplated utilizing only the ceramic particles of the Japanese '106 reference, and not the fabric as a whole.

However, as noted by the undersigned during the interview, it is submitted that the text of the final Office action (as well as the previous Office actions) clearly take the position that one of ordinary skill in the art would have provided the "fabric having ceramic particles" of the Japanese '106 reference, and used such fabric in the process of the Medwell reference. During that telephone conversation the Examiner indicated that the presence of the Fujino reference should have served as a signal that the entire fabric of the Japanese '106 reference is not being utilized in the rejection, but instead only the ceramic particles are being used.

However, it is submitted that Applicant can only rely upon the statements included in the Office action as accurately portraying the nature of the rejection. It is hoped that the Examiner can appreciate that given the choice between taking the words of a rejection at face value or attributing some other meaning to a rejection based upon the presence of a third reference, applicant must choose to accept the rejection at its face value. Further, none of the previous rejections included the text in the final Office action that suggested that only the ceramic particles of the Japanese '106 reference were being utilized in the rejection.

Thus, it is submitted that to the extent the final Office action (or a subsequent Office action) takes the position that the fabric as a whole of the Japanese '106 reference is not utilized, but instead only the ceramic particles are utilized, that such an argument constitutes a new rejection. Thus, it is submitted that the final Office action includes a new rejection that was not necessitated by applicant's amendment, and it is requested that the finality of the rejection be withdrawn so that applicant may have a full opportunity to respond.

In any case, with a fuller understanding of the rejection, applicant submits the following comments.

Initially it is submitted that the final Office action does not include sufficient motivation for the proposed modification. The Office action relies upon the Fujino reference as allegedly providing the motivation to use the ceramic particles of the Japanese '106 reference in the system of the Medwell reference. However, it is submitted that the Fujino reference does not provide such a teaching. In particular, the Fujino reference is directed to a cap having a mesh-like front surface fabric 21, a waterproof back surface fabric 22, and a non-woven fabric 23 disposed between the layers 21, 22 (column 2, lines 41-45). The cap is designed to be dipped in water so that the non-woven fabric 23 soaks up the water. The cap can then be worn and subsequent evaporation of the water out of the non-woven fabric 23 cools the wearer (column 3, line 59 – column 4, line 5). As noted at column 3, lines 19-22, in order to increase the evaporation rate of the water, far-infrared radiation fibers which may include powder ceramics may be added to the non-woven fabric 23.

However, neither the Medwell nor the Japanese '106 reference are directed to or anywhere mention evaporative cooling. In fact, as can be easily appreciated firefighter helmets are desired to be water-repellent to avoid the additional weight, discomfort, and loss of thermal conductivity that accompany water gain. Thus, it is submitted that the Fujino reference does not provide any motivation to one of ordinary skill in the art to utilize the ceramic particles of the Japanese '106 reference in the system of the Medwell reference.

It is noted that, at page 4 of the final Office action it is indicated that the Fujino reference “specifically” teaches that a high polymer mixed with ceramic particles “provides increased protection from infrared radiation.” However, it is submitted that this is not, in fact, the case. The Fujino reference discloses that “far-infrared radiation fibers” may be utilized to accelerate cooling due to evaporation (column 3, lines 19-22). Thus, the fibers, which are identified as “far-infrared” are in fact provided to accelerate cooling, and not to increase protection from infrared radiation.

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Thus, the final Office action appears to have used the claimed invention as a template for interpreting and arranging the cited references in a particular manner in an attempt to arrive at the claimed invention. Accordingly it is submitted that the references cannot be combined in the manner suggested in the Office action, and it is requested that the rejection of claim 1 be withdrawn.

The rejection of independent claims 17 and 42 is also traversed for the same reasons discussed above.

Furthermore, claim 1 has been amended to include the limitations of claim 58, and claim 58 has been canceled. Claim 1 now specifies that the coarse particles have an average size of between about 3 microns and about 1000 microns to improve the heat reflectivity of the helmet while maintaining sufficient strength of the helmet (see page 10, lines 12-15 of the specification). Further, due to the relatively large size of the ceramic particles, the ceramic particles become entangled with the fibers of the fiber-based filler during the curing process. This "entanglement" helps to avoid flowing of the ceramic particles to the "low spots" of the helmet and ensures a more even distribution of the ceramic particles (page 10, lines 15-19).

The final Office action does not indicate that the subject matter of claim 58 can be found in the prior art, but instead takes the position that "particle size is a result effective variable," citing to *In re Antoine* 559 F.2d 618 (CCPA). However, it is submitted that this rejection does not meet the *prima facie* standard required for obviousness rejections. In particular, the rejection does not properly identify the scope and content of the prior art, identify the distinctions between the prior art and the claimed invention, provide a suggestion or motivation to modify a reference or combine references, show a reasonable expectation of success, or make a showing of all of the claim limitations. Instead, the rejection merely summarily states particle size is a "result effective variable."

Further, it is not understood what a "results effective variable" is. It is speculated that this term means that a variable can simply be varied to achieve the desired result. However, the final Office action does not recite any "result" which the prior art seeks to achieve, nor does the Office

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action explain how varying particle size can help to achieve such a result. In particular, desired particle size depends upon the objective to be achieved and many other factors.

In fact, this case is analogous to the case cited in the Office action and relied upon in the rejection, *In re Antoine* 559 F.2d 618 (CCPA). In that case the Court of Customs and Patent Appeals held that the numerical ratio cited in the claims of that application were not obvious. The court held:

The PTO and the minority appear to argue that it would always be obvious for one of ordinary skill in the art to try varying every parameter of a system in order to optimize the effectiveness of the system even if there is no evidence in the record that the prior art recognized that particular parameter affected the result. As we have said many times, obvious to try is not the standard of 35 U.S.C. §103.

Id at 620.

Similar to the *Antoine* case, in this application there is no evidence that the prior art recognizes any criticality of particle size, and thus the authority cited in the Office action does not provide support for the rejection. Thus it is requested that the rejection of claim 1 be withdrawn.

At paragraph 7 of the Office action, claims 1, 5, 8, 11-13, 15, 17-19, 23, 27, 33-36, 42, 46, 49 and 52-57 are rejected as allegedly defining obvious subject matter over U.S. Pat. No. 5,794,271 to Hastings in view of the Japanese '106 reference and further in view of Fujino. The Office action admits that the Hastings reference does not teach a thermosetting resin impregnated fabric having ceramic particles mixed therein. The Office action then takes the position that it would have been obvious to have provided a thermosetting resin impregnated fabric having ceramic particles mixed therein as taught by the Japanese '106 reference, with a teaching provided by the Fujino reference.

Based upon the above-referenced interview the Office apparently takes the position that one of ordinary skill in the art would utilize only the ceramic particles of the Japanese '106 reference, and not the fabric as a whole of the Japanese '106 reference. Again, similar to the

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argument outlined above, it is submitted that this is a new rejection that was not necessitated by an amendment by applicant and it is requested that the finality of the Office action be withdrawn on this basis.

In any case, the Office action again relies on the Fujino reference as allegedly teaching that one of ordinary skill in the art would be motivated to use the ceramic particles of the Japanese '106 reference in the system of the Hastings reference. However, as noted above, the Fujino reference discloses the use of ceramic particles to speed evaporative cooling of water out of a hat, and neither the Hastings nor the Japanese '106 reference are directed to or anywhere mention evaporative cooling. Furthermore, as noted above, firefighter helmets are desired to be water-repellent to avoid the additional weight, discomfort, and loss of thermal conductivity that accompany water gain. Thus, the Fujino reference does not provide any motivation to one of ordinary skill in the art to utilize the ceramic particles of the Japanese '106 reference in the system of the Hastings reference.

Additionally, as noted above, the limitation with respect to particle size in claim 1 is not shown in the cited references.

The rejection of claims 3, 25 and 44 is traversed for the same reasons as claim 58 above. In particular, the range of sizes of particles specified in claims 3, 25 and 44 (i.e., approximately 7-8 microns) is selected so that the particles will not flow to "low spots" in the helmet during the curing process and to provide sufficient heat reflectivity while reducing height of the helmet. None of the prior art references reflect this consideration or engineering design behind the claimed range of particle sizes. Thus, it is submitted that the subject matter of claims 3, 25 and 44 is not obvious in light of the prior art.

In sum, it is noted that the present invention is broadly directed to the use of ceramic particles in a method of fabricating a protective helmet. Note of the cited references disclose the use of ceramic particles in fabricating a protective helmet. The only cited reference that discloses the use of ceramic particles discloses the use of such particles in a cap intended to be submerged in water, and the ceramic particles are provided to speed evaporation. Thus, none of the


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references teach the steps of the present invention, and it is submitted that one of ordinary skill in the art would not be motivated to combine the references to arrive at the claimed invention. Further, it is submitted that the ranges specified in claim 1 further distinguish over the cited art, and that several dependent claims further distinguish over the cited references. Thus, it is submitted that the application is in a condition for allowance and a formal notice thereof is earnestly solicited.

The Commissioner is hereby authorized to charge any additional fees required, including the fee for an extension of time, or to credit any overpayment to Deposit Account 20-0809.

The applicant(s) hereby authorizes the Commissioner under 37 C.F.R. §1.136(a)(3) to treat any paper that is filed in this application which requires an extension of time as incorporating a request for such an extension.

Respectfully submitted,

By 

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